Space Weather Forecast

Issued on Tuesday, 16 May 2023 at 01:04 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight Chance of R1/R2 radio blackouts throughout. Slight chance of a G1/Minor Geomagnetic Storm late Day 1.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the last 24 hours with occasional common class flares, the largest being a long duration C2.9 originating from a region that has crossed the western limb and is no longer visible. There are currently six numbered sunspot regions on the visible disc. The largest sunspot group has been largely inactive but is currently crossing the central meridian whilst showing signs of weak development. The remaining areas are relatively small and simple with little sign of change or showing signs of decay. A small filament lift-off (arc of plasma) was observed in the northwest quadrant early on the 15th, which produced a very faint, very slow Coronal Mass Ejection (CME). Another CME was observed in the southeast quadrant later in the UTC evening. The results of the analysis are still pending but no Earth-directed CMEs are expected at the time of writing.

Solar Wind / Geomagnetic Activity: The solar wind remaining at slightly elevated levels over the past 24 hours, varying slowly between 440-500km/s. The interplanetary magnetic field (IMF) has been steady and weak while its important north-south component displayed very small fluctuations. The net result of the above solar wind measures was mostly Quiet (Kp0-2) to Unsettled (Kp3) geomagnetic activity.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to remain Low, but with a chance of isolated Moderate activity. The risk may increase over the following days as a returning region is about to emerge into the south-eastern quadrant.

Solar Wind / Geomagnetic Activity: Geomagnetic conditions are expected to remain largely Quiet to Unsettled. There is a slight chance of a glancing blow from CME events that left the Sun 11-13 May. This may produce minor effects at Earth and a slight chance of a G1/Minor Geomagnetic storm interval in the early UTC hours of the 16th but a miss is considered more likely, with no observable effects. Solar winds are expected to gradually decline towards background levels.

Energetic Particles / Solar Radiation: There is a daily slight chance of S1, decreasing through the period as the main sunspot responsible for this risk continues to recede westwards.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	20	25	30	40
Very Active	R3 to R5 X	No	1	1	1	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	2	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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